SOIL conservation

U.S. Department of Agriculture / Soil Conservation Service / December 1975

From the Administrator

Identifying Prime Farmland

The Soil Conservation Service now has a written policy concerning some of the most important resources in the nation—prime and unique farmlands.

In recent years, special interest groups have called for the recognition of the importance of wetlands and recreational lands and hunting and fishing lands. Farmers and rural landowners feel that prime and unique farmlands are just as important—even more important—in sustaining the quality of our life.

In the SCS policy memorandum (LIM-3) we define prime farmland as land suited for producing food, feed, forage, fiber, and oilseed crops, and also available for these uses. The land could be cropland, pastureland, rangeland, or forest land. It has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed with modern farming methods.

These prime lands can be farmed continuously or nearly continuously without degrading the environment . . . they will produce the most with the least amount of energy . . . they are the most responsive to management and require the least investment for maintaining productivity.

Unique farmland is land, other than prime farmland, that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or yields of a specific crop when treated and managed according to modern farming methods. Such crops include citrus, olives, cranberries, fruit, and vegetables.

The policy memorandum spells out the soil characteristics and other physical criteria which the Service will now use to conduct a national inventory of prime and unique farmlands. By interpreting information in soil surveys in light of these physical criteria, we can identify and inventory the nation's most productive farmlands in a reasonable time.

We are conducting the inventory in cooperation with other interested agencies at the national, state, and local levels of government. Many of these agencies have worked closely with us to develop definitions so that the inventory will be uniform throughout the nation.

We are also initiating a monitoring system to reflect significant changes in the use of prime and unique farmlands. This, too, will help us monitor the productive capacity of American agriculture in the years ahead.

Under no circumstances will the inventories constitute a designation of any land area to a specific use, nor advocate such. Such designations are the prerogative of responsible officials of concerned local and state government agencies.

Now, those concerned with the preservation of prime and unique farmlands will have additional and better information on which to base judgments that will help preserve, protect, and improve these lands—the best producing lands in the United States.

SOIL conservation

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Earl L. Butz
Secretary of Agriculture

R. M. Davis, Administrator
Soil Conservation Service

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COVER: A harvest of barley attracted a photographer to this contoured field in the Fairfield Soil and Water Conservation District in South Carolina. More than 40 years ago, Fairfield County, then planted mostly in cotton, was described as one of the most eroded areas in America by Hugh Hammond Bennett, first chief of the Soil Conservation Service.

Floating Islands For Waterfowl In Arizona

by Leon F. Fager and John C. York
Biologist, SCS, Flagstaff and Phoenix, Arizona

Providing shore birds and waterfowl a safe spot to rest or nest on small stock ponds in the arid southwest has been a problem that's largely gone unsolved.

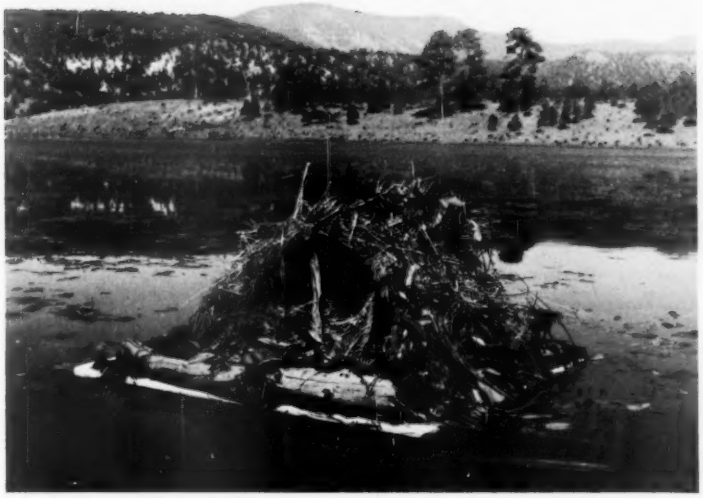
Open water is so scarce in Arizona that waterfowl are attracted to such ponds, but livestock grazing usually has eliminated shoreline cover. Landowners usually have few choices if they want to protect waterfowl from predators. They can build an earthen island, which takes up valuable area in an existing pool, or put up fencing, which is costly and requires watering lanes or offsite troughs for livestock.

We recently developed a "floating island" that is showing considerable promise in providing needed protection and nesting cover for these birds. Last summer, we put nine "floating islands" on ponds in northern Arizona and have found their use and the growth of vegetation on them exceeding our expectations.

The islands are made from Styrofoam and planted with vegetation from the pond site. Holes are drilled through the Styrofoam so that water seeps into the rooting zone of the plants, maintaining them in a manner similar to hydroponic culture. Each island has a covered nesting enclosure and an open "loafing" area.

Initially, the islands were made from sheet Styrofoam cut and glued together to make

Coauthor Leon Fager and summer aide Jesse Benta lace bulrush through the nest cover and plant vegetation on one of the "floating islands" designed for waterfowl.



Once completed, the islands are anchored in the pond with a rock. A stabilizer keeps them from being whipped around.

4-inch-thick platforms, either 4 feet square or 4 by 8 feet. To make a nesting square, we cut a 2-foot square of Styrofoam 2 inches thick and glued it to the center of the island. We placed a shaped cover of chicken wire over the square, laced willow or bulrush through the wire, and put dried grass in the nesting enclosure.

To make a rooting zone for plants, we cut a channel around the island 3 inches deep, 8 inches wide, and 1 inch from the outside edges. We drilled ½-inch holes through the bottom of the channel to allow water to seep in and keep the root systems wet. We then placed soil and vegetation from the pond site into the channels. The growth of plants in these channels has greatly exceeded expectations. Adapted plants are right at hand around the pond edge and the possibilities for landscaping the islands are limitless.

Sheet Styrofoam is relatively expensive. We solved that problem when we discovered that some motorcycles are shipped in large Styrofoam boxes that can be recycled into ideal islands 4 feet by 6 feet by 8 inches. These boxes have many grooves, depressions and indentations so that cutting channels isn't necessary. We simply drill holes in the bottoms of the depressions and plant. Motorcycle dealers have been very helpful in supplying boxes for this project.

We put the first of the islands in White Mountain Hereford Ranch's lake near Springerville last July. We put out eight more in privately owned stock ponds near Springerville, and this fall we've placed islands in other areas in the state.

We've sighted pintails, cinnamon teal, coots, mallards, and shore birds using the islands. We put the islands out a little late in the season for nesting. We've also observed that fathead minnows spawn on the underside of the islands and that the islands are used for part of the life cycle of many aquatic insects.

We encountered the problem of coots pecking holes in the original island, which was painted with a hard-curing epoxy. Now we've eliminated that problem by framing the islands with 8-inch-wide barkout pine.

We've made improvements, almost daily, as we gain experience.

To keep the lightweight islands from whipping around in the wind, we attached a stabilizer on the anchor rope. The stabilizer is 24 inches square and is spliced into the rope 3 feet from the island. The island is anchored with a single rope attached to a 25- to 30-pound rock. To date, wind damage has not been a problem.

This winter, we will leave a few islands in the ponds so we can check on ice and snow damage. With the light weight of the islands, it will be easy to pick them up for winter storage if this proves necessary.

Many Arizonans have expressed interest in the project. Requests for the islands are coming into SCS offices in northern Arizona, and both the Natural Resources Conservation Districts and the Arizona Wildlife Federation are considering sponsoring a program to put in "An Island Per Pond" in this area where open water is so scarce.

The islands don't fill all of the habitat requirements of waterfowl. They do provide essential protection and nesting cover in an area where both are lacking. ♦

New Upper Colorado Plant Center Focuses on Native Plants for Reclamation

by M. D. Burdick
State conservationist, SCS, Denver, Colorado

The rapid development of fossil fuel resources in the Upper Colorado River Basin has brought into new focus the need for special plants to solve reclamation problems.

As a result, two soil conservation districts in Colorado have established the Upper Colorado Environmental Plant Center near Meeker to develop native plant varieties and assure their commercial availability for reclamation of mined areas.

At the present time, seed sources for major plant species indigenous to the region are sorely lacking. Many of the dominant plants have never been adequately tested or developed for commercial production.

The two districts—Douglas Creek and White River Soil Conservation Districts—are setting up the center with specialized technical assistance from the Soil Conservation Service, which operates or cooperates in the operation of 21 other plant materials centers around the country.

The districts acquired 189 acres of prime agricultural land for the center and began construction of the basic facilities last spring. This past summer, a crash program was initiated to collect seeds for testing and evaluation next spring.

An experienced SCS center manager has been assigned full time to the Upper Colorado Environmental Plant Center by SCS and funds for the project have been provided by the Soil Conservation Service, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service, and the Energy Research and Development Agency, all of which have an interest in land improvement and restoration. Private industry has also provided financial support.

The need for accelerated testing and development of special plants to meet projected needs in the Upper Colorado region has been recognized for several

Construction on the Upper Colorado Environmental Plant Center near Meeker, Colorado, began last spring.

UPPER COLORADO
ENVIRONMENTAL PLANT CENTER
Owned and Operated by
Douglas Creek & White River Soil Conservation Districts
Cooperating with
U.S. Soil Conservation Service
U.S. Fish & Wildlife Service
U.S. Bureau of Land Management
U.S. Energy Research Development Adm.
Land & Energy Research Center - Laramie, Wyo.
Colorado State University
U.S. Forest Service (SEAM)
Colorado Seed Growers Association
Environmental Protection Agency

years by industry and the government agencies charged with land management responsibilities. The anticipated mining of vast areas of oil shale and coal reserves in the region, which includes western Colorado, eastern Utah, and southern Wyoming, could drastically disturb thousands of acres of unique land forms and ecosystems.

Last February, SCS completed an analysis of its plant materials assistance capabilities from existing centers. This study verified what was already suspected —that present plant materials centers are not located to adequately serve the Upper Colorado region.

The closest centers—at Los Lunas, New Mexico, Bridger, Montana, and Aberdeen, Idaho, are more than 300 miles from the center of the developing coal and oil shale industries in western Colorado. None of these centers is within the major land resource areas of the Upper Colorado Basin.

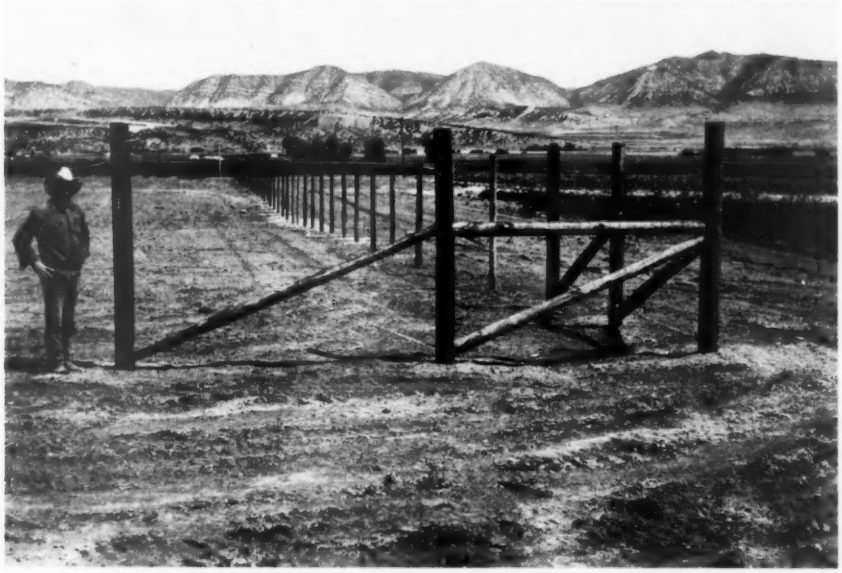
Early in 1974, SCS had begun exploring the options available for establishing a new plant materials center. These ranged from seeking Congressional authorization for a 100-percent federal facility to establishing a cooperative agreement with local soil conservation districts with funding from several sources. To meet the urgent need, the cooperative route proved most feasible.

The new center will develop native plant varieties for use in reclamation of land mined for oil shale and coal in the Upper Colorado region.

In addition to cooperation with federal agencies, the districts are also entering into cooperative agreements with Colorado State University and the Colorado Experiment Station to use their desert station at Fruita and facilities near Durango.

An advisory council is being organized to assist the districts in determining needs and priorities in project development. The council will be composed of representatives of federal and state agencies, universities, private industry, and others having needs related to plant materials development in the Upper Colorado region.

The need for commercial sources of native plants is evident in environmental restoration to return the land to natural plant communities vital to wildlife, seasonal grazing use, and acceptable esthetic levels. The purpose of the center is to develop such varieties and assure their commercial availability to those charged with reclamation of disturbed lands. ♦



An 8-foot fence was one of the first major jobs at the 189-acre center. The fence is necessary to keep out the many deer in the area.

Kindergarten students at Kauai's Hanalei Elementary School harvest their first radish crop.

Garden at Hanalei

by Phyllis Charles
Information specialist, SCS, Honolulu, Hawaii

Gardening? It's the growing thing at the rural Hanalei Elementary School on Kauai, the "Garden Island" of the Hawaiian chain.

Students call their garden at the school "The Farm," and the hands-on project complements indoor classes on soil, plants, and water and wind erosion.

The school garden started when the school principal, Nick Beck, recognized that the students, even though born and raised in a rural community, lacked personal experience with soils and plants just as their urban cousins did.

Beck serves on the board of directors of the East Kauai Soil and Water Conservation District, and he turned to the district for money and moral support and to the SCS district conservationist for technical help to enrich his students' "earthly" experiences.

The district conservationist, John Smithhisler, worked with the science teacher on basic

material presented in class. Teachers of all the grades, kindergarten through sixth, were encouraged to get their students involved with the garden in the science class periods. The teachers did the basic layout of the garden plot.

The older boys, using hand tools supplied by the soil and water conservation district, cleared a lushly overgrown corner of the schoolyard. The 75-foot-square plot marked out for the garden took a lot of "kalai" (hoe) "hana" (work) from the fourth and fifth graders.

Each grade level had its own section and made the decisions on what to plant. The kindergarten children decided to plant radishes and other rapid growing vegetables. Some of the lower grades chose bush beans, peas, and beets. The older students were willing to wait a bit longer for their crops and selected tomatoes, corn, soybeans, cabbage, and Chinese cabbage for their sections.

The garden provided a reason to consider safety in the use of tools and the proper care of equipment. Arithmetic and spelling seemed more palatable too when used for record keeping of garden activities.

In all this, the district directors let the students know they were interested in the garden and the gardeners. The SCS staff made occasional "farm visits" to check on progress and, when necessary, made suggestions.

When the first corn planting didn't do well, students received such suggestions as, "This hybrid corn is especially adapted to grow in Hawaii, why not try it instead," or "Try irrigating this section every other day."

Some students who had never had this exposure to nature have become so interested in the growing process that they have developed their own garden plots at home. ♦

Fourth-grade students learn proper care of tools and safety in handling them while establishing and working in the school garden.

Conservation Blossoms On 'Flower Farm'

by William Westrate
Former district conservationist,* SCS, St. Joseph, Michigan

What could the Soil Conservation Service do to help a "flower farmer"?

Peter DeGroot, one of the world's largest dahlia growers, contacted SCS for help several years ago on a wind erosion problem on his farm near Coloma, Michigan.

"Soil was blowing across the road so bad, drivers had to turn on their headlights to get by," DeGroot explained.

DeGroot farms 300 acres and ships about $1.5 million worth of bulbs and plants a year to wholesalers, discount stores, lawn and garden stores, and mail order houses in the United States and Canada. In addition to dahlias, he produces gladiolus, cannas, peonies, and other flowers, as well as rhubarb, asparagus, chives, and horseradish.

Due to the specialized nature of his crops, cover crops won't work in all situations. There also isn't enough snow for a good winter cover on his farm in the south of the state near Lake Michigan.

With technical assistance from SCS, DeGroot planted six single row windbreaks to control wind erosion, spacing the trees 10 feet apart in the row with 800 feet between rows.

PETER DeGROOT

The tree selected was Simon poplar, suggested by SCS for its quick growth and potential as a conservation planting. Although the trees are relatively short-lived, DeGroot is satisfied with them because of rapid growth—as much as 8 to 10 feet in 1 year—and the protection they provide.

Continually upgrading his operations to make the best use of his resources, DeGroot finds soils information particularly valuable. He makes use of sludge or treated domestic sewage on his farm, uses cover cropping, and plows under "green manure."

"The SCS has an open invitation to help with conservation practices on my farm," says this "flower farmer" who immigrated to the United States from Holland in 1950.

He is a cooperator with the St. Joseph River Soil Conservation District and this year was selected by the district as the runnerup "Conservation Farmer of the Year."

Reared in the bulb and plant business, DeGroot said he settled in the Coloma area because of its climate, geography, and special labor available. During peak periods, he employs 80 persons.

DeGroot uses highly specialized equipment on his farm and is planning to use computers in his planting and growing operations. He has a computer which he uses now for accounts, payroll, and inventory control. ♦

*Mr. Westrate retired in April 1975.

Title X Funds in Archuleta County

by William L. Hill
District conservationist, SCS, Pagosa Springs, Colorado

Last July, the U.S. Department of Commerce made $10.5 million available to the Soil Conservation Service under Title X, the Job Opportunities Program authorized under the Emergency Jobs and Unemployment Assistance Act of 1974. This money was to pass through SCS to conservation districts in areas of high unemployment and the districts were to hire the unemployed in conservation work. The San Juan Soil Conservation District in Archuleta County in southwest Colorado is one of those districts to receive Title X funds.

A soil conservation district employee, hired with Title X funds, learns to use surveying equipment in Archuleta County, Colorado.

In April of 1975, Archuleta County in Colorado had an unemployment rate of 17.3 percent. Welfare rolls had swelled to an all-time high. Unpaid bills stacked up and Pagosa Springs was the scene of continual unrest.

About that time the Soil Conservation Service was asked to identify conservation projects where people could be hired to accelerate the work.

Traditionally, the Soil Conservation Service and local soil conservation districts have been concerned about how natural resources are managed. People are also a natural resource and, if unemployed, their talents, skills, and abilities are wasted.

SCS worked with the San Juan Soil Conservation District as the district identified several resource conservation and development measures where individuals could be employed and complete needed work. The plans met criteria in Title X requiring that 75 percent of the money must go for salaries and only 25 percent could be used for materials and administration.

In July of 1975, the U.S. Department of Commerce funneled funds through SCS to the local soil conservation district to hire the unemployed.

The San Juan District received $613,500 and promptly hired 61 employees. District work crews tackled gully stabilization projects in the Valle Seco drainage.

The Archuleta County Airport is being topographically mapped by Title X crews for the county planner so he might accurately plan future airport growth including planning for wind and water erosion control. Two miles of fence were repaired by district personnel along the runway to protect areas and vegetation that stabilize the soil.

Downtown Pagosa Springs is getting a facelift while crews plant trees, riprap a steep slope with native rock, and improve a parking area.

Williams Creek Reservoir will also receive extensive changes, including a new boat ramp, fencing, and expansion of present recreation facilities.

Not only have many physical changes taken place, but employees hired under Title X found that their skills, talents, or abilities were necessary to get the job done. In fact, four of the Title X employees have found that their newly learned skills qualified them for placement with a new employer. ♦

Student Trainees In SCS

by Manly C. Wilder
Personnel Division, SCS, Washington, D.C.

Looking back on a summer with the Soil Conservation Service, one student trainee recalled the "chiggers, ticks, sunburn, chewing tobacco, animal waste system investigations on the hottest, stickiest day of the month, and survey notes that refused to check."

Then she added that she's "smiling about all of it" and feels the field experience she gained was invaluable.

That student — Melcy C. Curth of Purdue Universty—is one of 428 college students hired as student trainees by the Soil Conservation Service last summer.

These trainees provide a major source of professional employees for the Service. Once embarked on the training program during their freshman, sophomore, or junior years in college, they have career-conditional appointments and may join the Service full time upon graduation.

SCS has hired more than 6,000 students under the federal government's student trainee program during the last 15 years. It is the largest participant in the program in USDA and one of the largest in the federal government. The program is designed to attract high-quality students to help meet the long-range recruitment needs for professional employees. The work-study program gives trainees a chance to participate in SCS work and affords SCS the opportunity to evaluate the student's performance in a work situation. More than half of the trainees hired by SCS remain on as permanent, full-time employees.

Recruited through on-campus visits by SCS personnel at nearly 100 colleges and universities, the students are usually enrolled in agriculture, soil conservation, soils, agronomy, forestry, wildlife biology, or engineering. They are most often employed as soil conservationists, soil scientists, and civil or agricultural engineers.

Student trainees Alberto Garcia, Jr., and Teresa Cearl

Some also are employed as range conservationists and geologists.

Student trainees qualify in a civil service examination usually at the GS-3 or GS-4 level. They work during the summer, go on leave in the fall and return to school.

Cearley discuss range management with Melvin Bruns, range manager, U.S. Army Camp Bullis in Texas.

Assigned to work in a field office, they serve as a helper to a professional soil conservationist, soil scientist, range conservationist, or engineer. Through a comprehensive written training plan, the students not only learn the principles of conservation planning but how to install conservation practices. They work in the field and become familiar with soils, plants, aerial photography, woodland, wildlife, and surveying. Above all, they are taught that they are part of a technical action team which provides professional guidance to landowners and operators and local leaders in soil and water conservation.

The student trainee program is an integral part of SCS operations and receives strong support throughout the Service. Among its strongest advocates is Clete Gillman, SCS state con-

servationist in Indiana and one of nine state conservationists who are former student trainees. Gillman said he feels the program is an outstanding method of securing quality employees, and that the student trainee who stays with SCS is more ready for a professional position and can move more readily into positions of responsibility.

At left, SCS Range Conservationist Louis Cervantez instructs student trainees Martha Diehl and Jim Vancura in the use of an increment borer near Provo, Utah. Below, John Arnn (center), SCS state resource conservationist in Texas, discusses grass characteristics with four student trainees in Texas—Anthony W. Edison, Larry A. Jernigan, John L. Freeman, and Lawrence W. Fryer.

The program has given thousands of students an opportunity to apply their academic training in on-the-job situations. With work related to their studies, students can bring their training to the field and take their field experience back to the classroom.

In addition, the program strengthens the Soil Conservation Service. Students are inquisitive and question the traditional way of doing things. They generally raise questions that cause us in the Service to think more about what we are doing and why—and to take a fresh look at our own operations. ♦

Among the more than 400 SCS student trainees last summer, Sharon K. Schafer (at right) worked as a soil conservationist in Vancouver, Washington; Dan L. Boenig did similar work from the SCS office in Seguin, Texas; and Melcy Curth (below, at right) worked as an engineer trainee at the Vincennes, Indiana, area office. Boenig, who attends Texas A&M University, is a former national president of the student chapter of the American Society of Agronomy.

Stabilizing Stockpiles on the Texas Coast

by Kenneth L. Cash and Thomas P. Smith II
District conservationist and soil conservationist, SCS, Sinton, Texas

On extremely windy days not long ago, red clouds would hover over the Texas Gulf Coast towns of Gregory and Ingleside, reminiscent of a sand storm during the Dust Bowl days. The water of nearby Corpus Christi Bay would turn a reddish tint.

The "culprit" was soil containing bauxite ore, stockpiled in five huge, barren mounds near the coast. Owned by the U.S. Government, the soil is imported from Jamaica and stockpiled near the coast until needed in supplying aluminum for defense purposes. In its native state, it is fairly productive with the high rainfall of Jamaica, despite a poor plant-soil-moisture relationship.

Stockpiled in Texas in mounds up to 70 feet high, however, the bauxite was extremely susceptible to wind and water erosion. The fine, powder-like bauxite, aided by heavy fall rains and brisk gulf breezes, was eroding into the bay and nearby towns.

As a result of cooperation between government agencies, a manufacturing company, and a soil and water conservation district, however, the stockpiles have been stabilized—and natural resources protected.

It began in 1973, when two representatives from the General Services Administration (GSA), which manages the stockpile for the federal government, contacted the Soil Conservation Service for assistance in stabilizing the 80 acres of Jamaican soil.

The two men, Lyle Lovelace and Doyle Reeves from GSA's Property Management Division, discussed alternatives with SCS and decided that the most economical and long-term solution would be to vegetate the piles.

In cooperation with the San Patricio Soil and Water Conservation District, SCS plant materials specialists developed a vegetative stabilization plan for the project. The plan included preparing a seedbed by shaping the eroded slopes with a dragline and harrow; discing and harrowing the tops with a tractor; applying wood fiber mulch at the rate of 2,000 pounds per acre; fertilizing; and seeding a mixture of seven grass species — selection 75 Kleingrass, buffelgrass, King Ranch bluestem, Medio bluestem, buffalograss, NK-37 bermudagrass and common bermudagrass.

The seed, fertilizer, mulch, and water were mixed into a slurry and sprayed on with a hydromulcher. A sprinkler irrigation system was installed to help establish the grasses. This was needed because of the droughty characteristics of the extremely porous bauxite. Reynolds Metal Company, which owns the land on which the bauxite is stored, supplied pipe, pump, water, and labor to irrigate the piles.

SCS engineers developed a plan to intercept runoff and divert it into holding ponds. The runoff water will be recycled and used by Reynolds for industrial purposes. GSA obtained contractors to do the vegetative and construction installation.

The system of diversions was completed in late 1974, and the final seeding was completed in the spring of 1975. The tops of the piles are now lush with knee-high grasses and the slopes are making excellent progress.

The red tint has now left Corpus Christi Bay and the skies are clear once more. ♦

Slopes of stockpiled bauxite were shaped to smooth rills and prepare the seedbed.

Mulch, seed, and fertilizer were applied to the slopes with a hydromulcher.

Author Thomas P. Smith II examines the grass established on top of a stockpile.

Trailblazing in Tennessee For Outdoor Teaching

by James H. Eldridge
District conservationist, SCS, Jonesboro, Tennessee

Nearly every school day, children use the outdoors for study at Temple Hill Elementary School in the foothills of the Unaka Mountains in eastern Tennessee.

Their outdoor laboratory, in a densely wooded corner of the school's 5 acres, includes a nature trail along a mountain stream, a "classroom" under a huge hemlock tree, and an area developed for wildlife. The children and teachers have done most of the work on this project themselves.

"We gained the concept for our outdoor study area during in-service training last year when the Soil Conservation Service presented a program on using the outdoors for teaching conservation of natural resources," said the school principal, Robert Howell.

"It was during our first staff meeting that Mrs. Kate Edwards, fourth grade teacher, proposed developing our school ground for outdoor teaching as suggested during the in-service session," Howell continued.

To begin the project, Howell contacted the SCS district conservationist to inventory resources on the school grounds and help identify and evaluate potential uses. The school has an enrollment of 200 in the town of Erwin.

Once the inventory was completed, Howell appointed a committee of teachers and students to work with the district conservationist to develop a master plan. The plan was to facilitate using the grounds for teaching and to recommend treatment for problem areas, such as barren, eroding places on the playground.

Once the plan was completed, the students were anxious to get started and decided to develop the nature trail first.

They "blazed" the trail, just like Daniel Boone, who had hunted in this area—except that the students used marking tape instead of a knife or an ax. The kindergarten students let their imaginations run rampant, with visions of Boone killing a bear "on this very spot."

Everyone got into the act in helping "pave" the trail with wood chips and bark donated by a nearby sawmill.

Next, students cleared off their outdoor classroom site at the end of the trail. The site is secluded, with towering trees for a roof, bushes and wild honeysuckle vines for walls, and a carpet of pine needles for the floor. What to use for seating had yet to be decided when someone spotted large waterworn stones along the nearby streambank and suggested them. Everyone liked the idea because the stones blended so well with the natural environment. Eighth-grade boys placed them in semicircular rows for a neat seating arrangement.

By the time the students and teachers tackled the problem areas, enthusiasm for the project was at fever pitch.

Members of the Parent Teachers Association donated equipment to reestablish a dense green sod on the eroded playground. Students raked the soil, broadcast fertilizer and seed, and completed the job with a protective covering of mulch. Flowers, shrubs, and trees are also planned for this area.

On a bank behind the school, students planted white pine trees for erosion control and beautification.

In the area selected for the development of wildlife habi-

tat, students planted 50 autumn olive for winter food for songbirds. Other plantings, such as bicolor lespedeza, are planned to establish food and cover for songbirds and small animals.

Students have shown a tremendous amount of pride in their accomplishments on the school ground, Howell said. Hardly a day goes by without a group using the area to supplement and extend classroom activities.

For example, in language arts, students write poems and stories about the outdoors, learn new words and their meanings, and record observations in a field notebook.

In math, students study shapes and patterns in nature. Concepts of diameter, circumference, and radius come alive as trees are measured, and an acre is no longer an intangible term after it is measured and staked off.

In social studies, boredom vanishes as students explore local geography—hills, valleys, watersheds, and streams. Students make and interpret maps, study land use, measure climatic variations in relation to slope, exposure, and vegetative cover, and record such factors as precipitation, temperature, and wind direction.

Science also comes alive as excited students learn interrelationships of plants, animals, and man. They search for animal tracks, catch crayfish, periwinkles, and salamanders; identify trees, plants, and wildflowers; study soil formation, soil texture, acidity, and water absorption; and examine rocks for color composition, hardness, and origin.

The children also enjoy an enriched study of art and music outdoors. They paint and sketch with natural colors made from berries, charcoal, rocks, and leaves. They make collages and mosaics from natural materials and weave with grass and reeds. They write songs and record sounds of birds, stream, wind, and trees.

Few schools perhaps have resources for outdoor teaching that compare with Temple Hill, but no school ground is without air, wind, sunlight, pollution, a plot of soil, a few blades of grass, or bacteria. As interest grows in an outdoor classroom, as one starts with what is available, the school ground can be developed and improved as an outdoor laboratory. The kids will love it and so will you. ♦

Searching for periwinkles in a nearby mountain stream stirs up excitement among fourth grade students at Temple Hill Elementary School in Tennessee.

A Fishing Trip 'Hooks' into Conservation

by Roger D. Rayburn* and Willis J. Ridenour
Assistant manager, National Plant Materials Center, SCS, Beltsville, Maryland, and project coordinator, Little Kanawha Resource Conservation and Development Project, Parkersburg, West Virginia

On a fishing trip several years ago, Charles Wilson and Ken Greene paddled upstream in the North Fork of the Hughes River in western West Virginia to find out why the water was "running brown."

It's been said that a frustrated fisherman will go to any lengths to get his story out.

So when two fishermen in West Virginia's North Fork of the Hughes River found it "running brown," and no muskie or bass on their lines, they traced the source of the silt and did something about it that's resulted in stepped-up erosion control efforts in the watershed.

The two men, Charlie Wilson and Ken Greene, both from Parkersburg, West Virginia, canoed upstream during that fishing trip several years ago to look for causes of the muddy water. They discovered silt coming from five old railroad tunnels which the Baltimore and Ohio Railroad (B&O) had recently "daylighted" to put the tracks in the open and decrease maintenance costs.

Both men are members of the Wildlife Recreation Committee of the Little Kanawha Resource Conservation and Development Project (RC&D), and they brought up the siltation problem at a committee meeting when they returned home.

The committee members decided to bring the erosion problem from the "daylighting" to the attention of the railroad.

B&O officials readily agreed to revegetate the bare soil and contacted the Little Kanawha Soil Conservation District for

* Formerly district conservationist, Harrisville, West Virginia.

assistance. The local SCS district conservationist at that time, Shelby VanScoy, prepared a revegetation plan for the five daylighted tunnels.

B&O hired the district's work crew to seed 20 acres in Kentucky 31 tall fescue and plant 15 acres in locust trees and white pines. The railroad added 1,400 autumn olive shrubs for wildlife food and cover as well as erosion control and paid all revegetation costs.

In May 1973, 2 months after the seeding and planting began, all parties involved in the measure toured the area and found grass coming up and trees coming to life.

"If you would have told me 3 years ago that we would be seeing grass and trees growing on this area, I wouldn't have believed it," commented Leasure Maple, a Ritchie County farmer who serves on the board of supervisors of the Little Kanawha Soil Conservation District and on the board of directors of the Little Kanawha Resource Conservation and Development Project.

Maple said that the RC&D steering committee then met with engineers from the State Department of Highways regarding siltation in the North Fork from construction of U.S. 50.

"I feel this had an input toward conservation treatment to

A soil conservation district work crew, hired by B&O Railroad, spreads fertilizer and seeds the critically eroding areas with Kentucky 31 fescue grass (top photo). The crew also planted trees and shrubs above the new railroad line to protect the slopes from the erosive action of rainfall.

Coauthor Roger Rayburn returned to the revegetated area in its third growing season this year and found some of the locust trees 20 feet high. Autumn olive has also done well at the site.

highway construction areas here and elsewhere in West Virginia," Maple said.

Ritchie is a hilly, rural county where most of the land disturbance on private property has been on farms. The red clay hillsides erode easily when cleared.

Farming became the major land use in the mid-1800's when new roads and the B&O opened up the area. Row cropping on the steep hillsides caused the loss of the most fertile upland soils.

Today, most of the farmers in the area raise beef cattle part time and work in nearby chemical plants along the Ohio River. They keep the hillsides in permanent grass cover, but lack of fertilization and worn-out soils often result in a thin ground cover that erodes even under moderate grazing pressure. Because of the steep terrain, it's difficult or impossible to drive wheeled vehicles to apply lime and fertilizer on much of the land.

In response to the RC&D concern, the soil conservation district has asked SCS to inventory critically eroding areas in the entire North Fork of the Hughes watershed. The district is working to encourage landowners to improve ground cover to reduce siltation of the river.

"The revegetation of the B&O tunnels is only a beginning," said Dolph Hickman, another district supervisor from Ritchie County.

"We'd like to see everyone in the watershed work together to make the river run clean again."

"Fish reproduction will improve as the siltation in the North Fork slows up," concludes Charlie Wilson. "The fishing will be just like in the good ol' days." ♦

Soil surveys

Arkansas
Pulaski County. By George J. Haley, Randle O. Buckner, and Dorris F. Festervand. 1975. Soil Conservation Service in cooperation with Arkansas Agricultural Experiment Station. 65 pp., illus.; maps.

Iowa
Fremont County. By Lewis A. Clark and John R. Nixon. 1975. Soil Conservation Service in cooperation with Iowa Agriculture and Home Economics Experiment Station, Cooperative Extension Service, Iowa State University, and the Department of Soil Conservation, State of Iowa. 104 pp., illus.; maps.

Kansas
Ellis County. By Robert K. Glover, Larry D. Zavesky, William R. Swafford, and Quinten L. Markley. 1975. Soil Conservation Service in cooperation with Kansas Agricultural Experiment Station. 86 pp., illus.; maps.

Maryland
Harford County Area. By Horace Smith and Earle D. Matthews. 1975. Soil Conservation Service in cooperation with Maryland Agricultural Experiment Station. 118 pp., illus.; maps.

New Jersey
Sussex County. By Sylvester J. Fletcher. 1975. Soil Conservation Service in cooperation with New Jersey Agricultural Experiment Station and Cook College, Rutgers University. 119 pp., illus.; maps.

New Mexico
Santa Fe Area (Santa Fe County and Part of Rio Arriba County). By James J. Folks. 1975. Soil Conservation Service and Forest Service, and United States Department of The Interior, Bureau of Indian Affairs, in cooperation with the New Mexico Agricultural Experiment Station. 114 pp., illus.; maps.

Ohio
Union County. By D. D. Waters and F. Matanzo. 1975. Soil Conservation Service in cooperation with Ohio Department of Natural Resources, Division of Lands and Soil, and Ohio Agricultural Research and Development Center. 79 pp., illus.; maps.

Pennsylvania
Franklin County. By Richard S. Long. 1975. Soil Conservation Service in cooperation with The Pennsylvania State University, College of Agriculture, and the Pennsylvania Department of Environmental Resources, State Conservation Commission. 122 pp., illus.; maps.

Virginia
Madison County. By J. H. Elder, Jr., and D. E. Pettry. 1975. Soil Conservation Service in cooperation with Virginia Polytechnic Institute and State University. 143 pp., illus.; maps.

Meetings

December

2–5 *Western Forestry Conference, Vancouver, British Columbia*

3–5 *Twenty-second Annual Meeting Keep America Beautiful, Inc., Washington, D.C.*

4–5 *National Association of Manufacturers, New York, N.Y.*

8–12 *American Geophysical Union, San Francisco, Calif.*

9–11 *American Seed Trade Association Corn & Sorghum Industry Research Conference, Chicago, Ill.*

11–12 *American Seed Trade Association Soybean Research Conference, Chicago, Ill.*

12–17 *Second World Congress on Water Resources, New Delhi, India*

15–18 *American Society of Agricultural Engineers, Chicago, Ill.*

28–30 *Joint Meetings—American Agricultural Economics Association and American Economic Association, Dallas, Tex.*

January 1976

13–17 *American Seed Trade Association Garden Seed Conference, San Francisco, Calif.*

14–15 *National Council of Farm Cooperatives, Washington, D.C.*

19–22 *National Wool Growers Association, Wichita, Kans.*

19–22 *North American Game Breeders and Shooting Preserve Association Convention, Milwaukee, Wisc.*

27–30 *American National Cattlemen's Association, Phoenix, Ariz.*

February

1–5 *National Association of Conservation Districts, Honolulu, Hawaii*

4–6 *Commercial Fish Farmer Showcase (Catfish Farmers of America Official Convention), Biloxi, Miss.*

16–20 *Society for Range Management, Omaha, Nebr.*

18–24 *American Association for the Advancement of Science, Boston, Mass.*

20–23 *American Association of School Administrators, Atlantic City, N.J.*

22–25 *Sprinkler Irrigation Association Technical Conference, Kansas City, Mo.*

25–27 *Land Improvement Contractors of America, San Diego, Calif.*

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